

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE CLAIMS

Claims 1 and 3 have been amended to clarify the patentably distinguishing feature of the present invention whereby the light-applying fiber and the light-receiving fiber are bundled to form a fiber bundle, and an objective optical system is provided at a front end of the fiber bundle, as supported by the disclosure in the specification at, for exmaple, page 8, lines 14-21.

In addition, the claims have been amended to make some minor grammatical improvements and/or to correct some minor antecedent basis problems so as to put the claims in better form for issuance in a U.S. patent.

No new matter has been added, and it is respectfully requested that the amendments to the claims be approved and entered.

THE PRIOR ART REJECTION

Claims 1 and 2 were rejected under 35 USC 102 as being anticipated by Hendler et al (USP 5,966,212), and claims 3 and 4

were rejected under 35 USC 103 as being unpatentable in over Hendler et al in view of Wang et al (USP 6,445,447). These rejections, however, are respectfully traversed with respect to the claims as amended hereinabove.

According to the claimed present invention, a photosensor device and a disk inspection apparatus are provided which include: a light-applying fiber (107) to apply an inspection light to a subject to be inspected; a light-receiving fiber (108) to receive a reflected light from the subject to be inspected; a laser beam source (114) to emit the inspection light to the light-applying fiber; and a photosensor (113) to receive the reflected light via the light-receiving fiber. Significantly, as recited in the amended claims, the light-applying fiber (107) and the light-receiving fiber (108) are bundled to form a fiber bundle (103a, 104a), and an objective optical system (109) is provided at a front end of the fiber bundle (103a, 104a).

With this structure, the objective optical system (109) serves both as a condensing lens for the light-applying fiber (107) and as a light receiving (collecting) lens for the light-receiving fiber (108), whereby the number of parts can be reduced.

In addition, with this structure, the optical axis of the light-applying fiber (107) and the optical axis of the light-

receiving fiber (108) can be made substantially the same, so as to form a pseudo coaxial sensor. Accordingly, the fiber bundles can be disposed perpendicular to the disc surface, whereby the alignment of the fiber bundles can easily be made and the fiber bundles can be disposed close to the disc surface.

Still further, by disposing the fiber bundles perpendicular to the disc surface, the depth of focus can be made large. As a result, it is possible to detect not only abnormality on the disc surface, but also bubbles, foreign matter, etc. in the disc, and it is also possible to detect an abnormality on the rear surface of the disc at the same time.

Likewise, the photosensor device and disk inspection apparatus of the claimed present invention are less likely to be influenced by the camber or warping of the disc, and the focusing etc. of lenses can easily be adjusted.

In contrast to the claimed present invention, Hendler et al discloses in Fig. 4A a structure requiring a laser beam light source 110, a collimating lens 120 for collimating emitted light into a parallel light beam, and a Fourier transform lens 130 and a collecting lens 150 before a photodetector 160. With this structure, it is required to adjust each of the optical axis of the emitted light and the optical axis of the reflected light. In addition, in Hendler et al, the emitted light is applied

slantwise to the substrate (a reflective device) and the reflected light is received, whereby the depth of focus is small and as a result, for example, only one point of the substrate surface can be inspected. Still further, the inspection system of Hendler et al is likely influenced by the camber, etc. of the disc, and another optical system for correcting this influence may sometimes be needed.

Wang et al has merely been cited for the disclosure of a rotating disk optical scanning system using a fiber laser. This reference, however, does not appear to disclose a specific structure of a photosensor device having a light-applying fiber, a light-receiving fiber to receive the reflected light from the subject to be inspected, a laser beam source to emit the inspection light to the light-applying fiber, and a photosensor to receive the reflected light via the light-receiving fiber, as according to the claimed present invention.

Accordingly, it is respectfully submitted that the present invention as recited in the amended claims patentably distinguishes over Hendler et al, taken singly or in combination with Wang et al, under 35 USC 102 as well as under 35 USC 103.

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In view of the foregoing, entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



Douglas Holtz  
Reg. No. 33,902

Frishauf, Holtz, Goodman & Chick, P.C.  
767 Third Avenue - 25th Floor  
New York, New York 10017-2023  
Tel. No. (212) 319-4900  
Fax No. (212) 319-5101

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